



App. No. : 10/621,197
Applicant : Hartley Owen
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INFORMATION DISCLOSURE STATEMENT

Sir:

This IDS reviews the problem, the invention and the closest art known.

PROBLEM – THERMAL CRACKING IN A CATALYTIC CRACKER

FCC units have evolved to use all riser cracking, with cyclones on the riser outlet to rapidly separate cracked products from spent catalyst which was sent down to the stripper. Stripping steam recovers additional cracked product from spent catalyst, but the stripper vapor spends a long time in the reactor vessel and thermally cracks. The reactor vessels are large and the stripper vapor residence time is excessive, because many of the vessels were sized to handle both vapor from the riser and the stripper. Closed cyclones improved yields from the riser and created an unwanted thermal cracking zone above the stripper.

THE SOLUTION – AN INVERTED SNORKEL

Inventor Owen devised a way to get stripper vapor out of the reactor vessel quickly, to reduce thermal cracking. The device operates like an upside down snorkel, quickly removing cracked product from above the stripper, minimizing thermal cracking. The snorkel solves another problem in FCC units, a vapor removal device which can withstand huge temperature swings and years of “sandblasting” in the FCC unit. The snorkel can be attached to, or be part of, the primary cyclone.

THE ART:

Closed cyclone systems were developed and/or used by most refiners. US 5,055,177, Haddad et al is a good closed cyclone design.

Riser quench, in which feed and/or catalyst enter the reactor extra hot, and the riser contents quenched in transit, allows catalytic cracking to occur at high temperature, and reduces temperature to reduce thermal cracking downstream of the riser. This reduces, but does not eliminate, thermal cracking. US 4,818,372 and US 5,389,232 disclose riser quench .

Post riser quenching is disclosed in US 4,978,440.

A stripper cap disclosed in US 4,946,656 isolates the FCC stripper to facilitate removal of stripper vapor. Thermal cracking is still a problem for stripper vapor passing through the cap of the stripper into the reactor vessel. '656 recognized some of the problem (thermal cracking of stripper vapors) but provided only a partial solution with an approach which could be hard to implement, mechanically, in an FCC.

Early action is respectfully solicited. If the Examiner believes patentable subject matter is present, but there are concerns about claim language, a telephone interview is invited.

Respectfully submitted



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